Large Cleaner Detectors for the UCN\textsubscript{\texttau} Neutron Lifetime Experiment FRANCISCO GONZALEZ, Indiana University, UCNTAU COLLABORATION — The UCN\textsubscript{\texttau} experiment at Los Alamos National Laboratory measures the neutron $\beta$-decay lifetime by storing ultracold neutrons (UCNs) in a magneto-gravitational trap for holding times longer than the neutron’s lifetime. Neutrons with energies above the trapping potential can escape the trap, giving rise to a systematic error. To mitigate this effect, a large polyethylene sheet is lowered into the trap to remove the high energy unbound neutrons. High energy UCN upscatter in the polyethylene sheet and leave the trap. Such a “UCN spectrum cleaner,” covering half the trap top, was shown to be effective in removing high-energy neutrons in previous run cycles. During this run cycle, the UCN\textsubscript{\texttau} collaboration has added two thermal neutron detectors on the spectrum cleaner. The new thermal neutron detectors will monitor high-energy neutrons throughout upcoming run cycles, providing important information on the neutron normalization, spectral cleaning, and heating during storage. These detectors use LiF-ZnS sheets coupled to a wavelength-shifting plastic slab, with silicon photomultipliers attached to the edges. We will present results of the light detection simulation and performance tests of these detectors.